

B.E / B.Tech. PRACTICAL END SEMESTER EXAMINATIONS, APRIL/MAY 2023

Fourth Semester

ME3461 - THERMAL ENGINEERING LABORATORY

(Regulations 2021)

Time : 3 Hours

Answer any one Question

Max. Marks 100

Aim/Principle/Apparatus required/Procedure	Tabulation/Circuit/ Program/Drawing	Calculation & Results	Viva-Voce	Record	Total
20	30	30	10	10	100

1. Determine the actual valve timing for a 4-stroke diesel engine and hence draw the following diagram **(100 Marks)**
 - (i) What are the positions of inlet valve opening and closing?
 - (ii) What are the exhaust valve opening and closing positions?
 - (iii) Indicate the ignition period in the diagram.
2. Conduct the port timing diagram test on a cut section model of a single cylinder two stroke petrol engine and find out the suction, compression, expansion and exhaust periods, and draw the port timing diagram **(100 Marks)**
3. Conduct experiments on engines and draw characteristics curves and actual P-V diagrams of IC engines. **(100 Marks)**
4. Conduct the experiment on performance characteristics of the engine and draw Performance curves and compare with standards. **(100 Marks)**
5. Prepare heat balance sheet on twin cylinder diesel engine for 4-stroke diesel engine **(100 Marks)**

6. Prepare the heat balance sheet by conducting performance test on single cylinder 4-stroke diesel engine (with electrical brake dynamometer). **(100 Marks)**

7. Calculate Performance of a diesel/ semi diesel engine from no load to full load (at constant speed) for a single cylinder/ multi- cylinder engine in terms of brake power, indicated power, mechanical efficiency and SFC (Specific fuel consumption) and further obtain power consumption curves and draw the heat balance sheet. **(100 Marks)**

8. Evaluate Engine friction by conducting Morse test on 4-Stroke Multi cylinder Petrol Engine. **(100 Marks)**

9. Determination of frictional power of an engine by retardation through additional flywheel method. **(100 Marks)**

10. Evaluate Engine friction by conducting motoring/ retardation and motoring test on 4- S diesel engine. **(100 Marks)**

11. Conduct an experiment on IC engine and Draw the actual P- θ diagram and calculate the heat release characteristics of IC engine **(100 Marks)**

12. Determine flash point and fire point of various fuels / lubricants. **(100 Marks)**

13. Calculate performances test on a two stage reciprocating air compressor and also determine the volumetric and isothermal efficiency. **(100 Marks)**

14. Determine the performance test on two stage reciprocating air compressor and to plot graphs between Volumetric Efficiency Vs pressure ratio, Adiabatic Efficiency Vs pressure ratio and Isothermal Efficiency Vs pressure ratio at various delivery pressure. **(100 Marks)**

15. Determine the following in a refrigeration system (i) Experimental COP, (ii) Carnot COP, (iii) Relative COP **(100 Marks)**
16. Determine the COP, Refrigerant flow rate and capacity of a given refrigerant system and its control where throttling of the refrigerant is accomplished in a
- i) a capillary tube.
 - ii) a thermostatic expansion valve **(100 Marks)**
17. Study the working of Impulse and Reaction steam turbines and List out the types, principles of operations, components and applications of steam turbines. **(100 Marks)**
18. Study about the working principle of steam generator and List out the types, principles of operations, components condensers, feed water and circulating water systems and applications of steam generator. **(100 Marks)**
19. Conduct the experiment on performance characteristics and evaluate energy balance test on steam generator and draw the necessary curves. **(100 Marks)**
20. Conduct the experiment on performance characteristics and evaluate energy balance test on steam turbine and draw the necessary curves. **(100 Marks)**